



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/060,109

01/28/2002

Bakul P. Patel

8317-0129-999

5909

20583

7590

07/27/2004

JONES DAY
222 EAST 41ST ST
NEW YORK, NY 10017

EXAMINER

DELCOTTO, GREGORY R

ART UNIT

PAPER NUMBER

1751

DATE MAILED: 07/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

mk
WY

Office Action Summary	Application No. 10/060,109	Applicant(s) PATEL ET AL.	
	Examiner Gregory R. Del Cotto	Art Unit 1751	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-100 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-100 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-47, 49, 50, 52-59, and 61-100 are pending. The preliminary amendments filed 5/19/04 and 5/21/02 have been entered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-7, 13-18, 21-47, 49, 50, 52-59, 61, 68-80, 82-90, and 92-100 are rejected under 35 U.S.C. 103(a) as being unpatentable over Small et al (US 2002/0037820).

Small et al teach a composition for stripping of photoresist and the cleaning of residues from substrates, and for silicon oxide etch, comprising from about 0.01% by weight to about 10% by weight of one or more fluoride compounds, from about 10 to about 95% by weight of a sulfoxide or sulfone solvent, and from about 20% to about 50% by weight water. The composition may contain corrosion inhibitors, chelating agents, co-solvents, basic amine compounds, surfactants, acids, and bases. See Abstract. Suitable fluoride compounds include ammonium hydrogen fluoride and hydrogen fluoride. See page 4, lines 1-20. Suitable basic amine compounds include hydroxylamine, hydrazine, monoethanolamine, cholines, triethanolamine, etc. Suitable chelating agents include those as disclosed in US 5,672,577. Additionally, the compositions may contain surfactants and suitable surfactants include anionic, cationic, nonionic, and amphoteric surfactants. Additionally, acids such as nitric, sulfuric, phosphoric, citric, gallic, oxalic, etc., may be used in the compositions. See page 5, lines 1-69. Note that, with respect to "foam" as recited in the preamble of the instant claims, the Examiner asserts that the compositions as taught by Small et al would have the same foam properties as the compositions recited by the instant claims because Small et al teach compositions containing the same components in the same proportions as recited by the instant claims, including surfactants which have foaming properties. Additionally, this foam would necessarily have a gas present such as air.

Small et al do not teach, with sufficient specificity, a foam composition containing at least one fluoride compound, at least one solvent, at least one gas, at least one

surfactant, water, and the other requisite components of the composition in the specific proportions as recited by the instant claims.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to formulate a foam composition containing at least one fluoride compound, at least one solvent, at least one gas, at least one surfactant, water, and the other requisite components of the composition in the specific proportions as recited by the instant claims, with a reasonable expectation of success and similar results with respect to other disclosed components, because the broad teaching of Small et al suggest a foam composition containing at least one fluoride compound, at least one solvent, at least one gas, at least one surfactant, water, and the other requisite components of the composition in the specific proportions as recited by the instant claims.

Claims 1-4, 7-12, 15-18, and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Torii et al (US 5,972,862).

Torii et al teach a cleaning liquid for producing a semiconductor device comprising a fluorine-containing compound, a water-soluble or water-miscible organic solvent, an inorganic acid and/or organic acid, and optionally, a quaternary ammonium salt. See Abstract. Suitable organic solvents include amides such as formamide, N-methylformamide, N-methylpyrrolidone, r-butyrolactone, ethyl lactate, diethylene glycol, dimethyl sulfoxide, etc. Suitable acids include boric acid, phosphoric acid, bromic acid, benzoic acid, etc. See column 5, lines 1-45. Additionally, quaternary ammonium compounds may be used in the compositions. See column 5, line 40 to column 6, line

35. Note that, the Examiner asserts that these quaternary ammonium compounds would be encompassed by the terminology "surfactants" as recited by the instant claims.

Note that, with respect to "foam" as recited in the preamble of the instant claims, the Examiner asserts that the compositions as taught by Torii et al would have the same foam properties as the compositions recited by the instant claims because Torii et al teach compositions containing the same components in the same proportions as recited by the instant claims, including surfactants which have foaming properties. Additionally, this foam would necessarily have a gas present such as air.

Torii et al do not teach, with sufficient specificity, a foam composition containing at least one fluoride compound, at least one solvent, at least one gas, at least one surfactant, water, and the other requisite components of the composition in the specific proportions as recited by the instant claims.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to formulate a foam composition containing at least one fluoride compound, at least one solvent, at least one gas, at least one surfactant, water, and the other requisite components of the composition in the specific proportions as recited by the instant claims, with a reasonable expectation of success and similar results with respect to other disclosed components, because the broad teaching of Torii et al suggest a foam composition containing at least one fluoride compound, at least one solvent, at least one gas, at least one surfactant, water, and the other requisite

components of the composition in the specific proportions as recited by the instant claims.

Claims 1-7 and 15-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cheung et al (US 6,235,693).

Cheung et al teach a composition for the cleaning of residues from substrates containing from about 0.01% by weight to about 10% by weight of one or more fluoride compounds, from about 20 to 50 percent by weight water, from 20 to 80 percent by weight lactam solvent, and from 0 to 50 percent by weight organic sulfoxide or glycol solvent. Suitable solvents include lactams, piperidones, pyrrolidones, etc. Chelating agents are also used in the compositions and suitable chelating agents are those disclosed in US 5,672,577. Additionally surfactants may also be used in the compositions and include anionic, cationic, amphoteric, nonionic surfactants, etc. Furthermore, acids may also be used in the compositions and include formic acids, ascorbic acids, citric acids, gallic acids, etc. See column 6, lines 35-69.

Note that, with respect to "foam" as recited in the preamble of the instant claims, the Examiner asserts that the compositions as taught by Cheung et al would have the same foam properties as the compositions recited by the instant claims because Cheung et al teach compositions containing the same components in the same proportions as recited by the instant claims, including surfactants which have foaming properties. Additionally, this foam would necessarily have a gas present such as air.

Cheung et al do not teach, with sufficient specificity, a foam composition containing at least one fluoride compound, at least one solvent, at least one gas, at

least one surfactant, water, and the other requisite components of the composition in the specific proportions as recited by the instant claims.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to formulate a foam composition containing at least one fluoride compound, at least one solvent, at least one gas, at least one surfactant, water, and the other requisite components of the composition in the specific proportions as recited by the instant claims, with a reasonable expectation of success and similar results with respect to other disclosed components, because the broad teaching of Cheung et al suggest a foam composition containing at least one fluoride compound, at least one solvent, at least one gas, at least one surfactant, water, and the other requisite components of the composition in the specific proportions as recited by the instant claims.

Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Small et al (US 6,248,704).

Small et al teaches a composition for the cleaning of residues from substrates from about 0.0 percent by weight to about 5% by weight fluoride compounds, from about 20 percent by weight to about 50% by weight water, from about 20 percent to 80% by weight of an organic amide solvent and from 0 to 505 by weight of an organic sulfoxide solvent. Additionally, the composition contains corrosion inhibitors, chelating agents, surfactants, acids, and bases. See Abstract. Note that, with respect to "foam" as recited in the preamble of the instant claims, the Examiner asserts that the compositions as taught by Small et al would have the same foam properties as the

compositions recited by the instant claims because Small et al teach compositions containing the same components in the same proportions as recited by the instant claims, including surfactants which have foaming properties. Additionally, this foam would necessarily have a gas present such as air.

Small et al do not teach, with sufficient specificity, a foam composition containing at least one fluoride compound, at least one solvent, at least one gas, at least one surfactant, water, and the other requisite components of the composition in the specific proportions as recited by the instant claims.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to formulate a foam composition containing at least one fluoride compound, at least one solvent, at least one gas, at least one surfactant, water, and the other requisite components of the composition in the specific proportions as recited by the instant claims, with a reasonable expectation of success and similar results with respect to other disclosed components, because the broad teaching of Small et al suggest a foam composition containing at least one fluoride compound, at least one solvent, at least one gas, at least one surfactant, water, and the other requisite components of the composition in the specific proportions as recited by the instant claims.

Claims 79, 80, 82, and 84-100 are rejected under 35 U.S.C. 103(a) as being unpatentable over Honda et al (US 5,798,323).

Honda et al teach a non-corrosive photoresist stripping and cleaning composition containing about 5% to about 50% of a solvent selected from the group consisting of N-

methyl-2-pyrrolidone, dimethyl sulfoxide, etc., about 10% to about 90% of an alkanolamine such as diethyleneglycolamine, monoethanolamine, triethanolamine, etc, from 0.1% to about 4% of a chelating agent, and 0.1% to about 40% of water. Optional ingredients include water-soluble surfactants including poly(ethylene oxide) under the trade name Poly-Tergent CS-1. See column 6, lines 1-20. Note that, with respect to "foam" as recited in the preamble of the instant claims, the Examiner asserts that the compositions as taught by Honda et al would have the same foam properties as the compositions recited by the instant claims because Honda et al teach compositions containing the same components in the same proportions as recited by the instant claims, including surfactants which have foaming properties. Additionally, this foam would necessarily have a gas present such as air.

Honda et al do not teach, with sufficient specificity, a foam composition containing at least one alkanolamine, at least one solvent, at least one gas, at least one surfactant, water, and the other requisite components of the composition in the specific proportions as recited by the instant claims.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to formulate a foam composition containing at least one alkanolamine, at least one solvent, at least one gas, at least one surfactant, water, and the other requisite components of the composition in the specific proportions as recited by the instant claims, with a reasonable expectation of success and similar results with respect to other disclosed components, because the broad teaching of Honda et al suggest a foam composition containing at least one alkanolamine, at least one solvent,

at least one gas, at least one surfactant, water, and the other requisite components of the composition in the specific proportions as recited by the instant claims.

Claims 62-67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brighamm et al (US 2003/0073593).

Brighamm et al teach slurry compositions comprising an oxidizing agent, optionally a copper corrosion inhibitor, abrasive particles, surface active agent, a source of chloride, and a source of sulfate ions. See Abstract. Suitable oxidizing agents include periodic acid, etc. Typical copper corrosion inhibitors include imidazoles, triazoles, etc. See page 2, lines 1-50. The slurry is preferably an aqueous slurry and may contain solvents such as propylene carbonate, glycerol, ethylene glycol, etc. The compositions also may contain a surface active agent such as anionic, cationic, nonionic, and zwitterionic surfactants. See page 2, lines 1-50.

Note that, with respect to "foam" as recited in the preamble of the instant claims, the Examiner asserts that the compositions as taught by Brigham et al would have the same foam properties as the compositions recited by the instant claims because Brigham et al teach compositions containing the same components in the same proportions as recited by the instant claims, including surfactants which have foaming properties. Additionally, this foam would necessarily have a gas present such as air.

Brigham et al do not teach, with sufficient specificity, a foam composition containing at least one alkanolamine, at least one solvent, at least one gas, at least one surfactant, water, and the other requisite components of the composition in the specific proportions as recited by the instant claims.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to formulate a foam composition containing at least one alkanolamine, at least one solvent, at least one gas, at least one surfactant, water, and the other requisite components of the composition in the specific proportions as recited by the instant claims, with a reasonable expectation of success and similar results with respect to other disclosed components, because the broad teaching of Brigham et al suggest a foam composition containing at least one alkanolamine, at least one solvent, at least one gas, at least one surfactant, water, and the other requisite components of the composition in the specific proportions as recited by the instant claims.

Claim 81 is rejected under 35 U.S.C. 103(a) as being unpatentable over Small et al (US 2002/0037820) as applied to claims 1-7, 13-18, 21-47, 49, 50, 52-59, 61, 68-80, 82-90, and 92-100 above, and further in view of Skee et al (US 5,989,353).

Small et al are relied upon as set forth above. However, Small et al do not teach the use of morpholine in addition to the other requisite components of the composition as recited by the instant claims.

Skee et al teach a cleaning composition for microelectronics wafer substrates containing an aqueous solution of an alkaline metal ion-free base and a polyhydroxy compound. See Abstract. Suitable alkaline containing compounds include 2-aminoethanol, morpholine, etc. See column 5, lines 1-50.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to use an amine such as morpholine in the cleaning composition taught by Small et al, with a reasonable expectation of success, because Skee et al

teach the equivalence of morpholine to monoethanolamine in a similar cleaning composition and further, Small et al teach the use of monoethanolamine.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-23 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 10 of U.S. Patent No. 6,235,693, claims 21 and 22 of US 6,248,704. Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 10 of US 6,235,693 and claims 21 and 22 of US 6,248,704 encompass the material limitations of the instant claims.

Note that, with respect to "foam" as recited in the preamble of the instant claims, the Examiner asserts that the compositions as claimed by US 6,235,693 or US 6,248,704 would have the same foam properties as the compositions recited by the instant claims because US 6,235,693 or US 6,248,704 claim compositions containing the same components in the same proportions as recited by the instant claims,

including surfactants which have foaming properties. Additionally, this foam would necessarily have a gas present such as air.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to formulate a foam composition containing at least one fluoride compound, at least one solvent, at least one gas, at least one surfactant, water, and the other requisite components of the composition in the specific proportions as recited by the instant claims, with a reasonable expectation of success and similar results with respect to other disclosed components, because claim 10 of US 6,235,693 and claims 21 and 22 of US 6,248,704 suggest a foam composition containing at least one fluoride compound, at least one solvent, at least one gas, at least one surfactant, water, and the other requisite components of the composition in the specific proportions as recited by the instant claims.

Conclusion

2. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Remaining references cited but not relied upon are considered to be cumulative to or less pertinent than those relied upon or discussed above.

Applicant is reminded that any evidence to be presented in accordance with 37 CFR 1.131 or 1.132 should be submitted before final rejection in order to be considered timely.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory R. Del Cotto whose telephone number is (571)

Art Unit: 1751

272-1312. The examiner can normally be reached on Mon. thru Fri. from 8:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yogendra Gupta can be reached on (571) 272-1316. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Gregory R. Del Cotto
Primary Examiner
Art Unit 1751

GRD
July 26, 2004